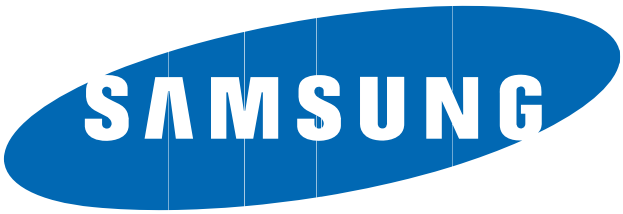

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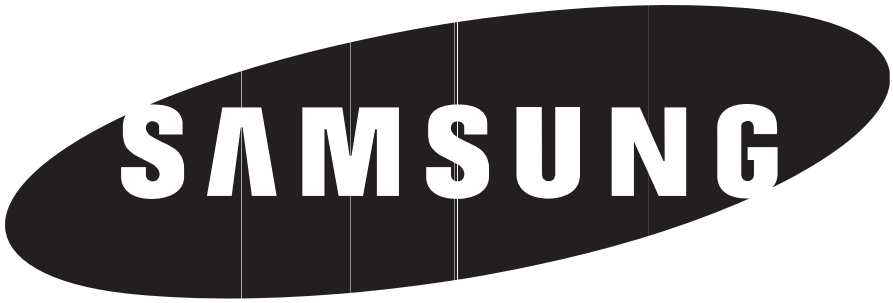

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Advisory note:

An understanding of basic refrigeration, electricity and thermal dynamics is needed to fully understand this material
If you do not have HVAC/R experience this training information will not be helpful

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MINI SPLIT BASICS

What is a Mini-Split?

A typical definition of a mini split is a split air conditioner or heat pump, without ductwork (ductless), the evaporator is usually mounted in or adjacent to the area being cooled. Other features are typically low air volume, continuous fan operation, low noise levels and remote control. Typical uses are Residential and light commercial (offices)

Why use a Mini-Split?

The first answer that most people think of is : I don't have or can't install any ductwork.
Many other reasons are:

Comfort, Mini-splits offer greater comfort when compared to traditional air conditioning units. The lower air volume promotes greater dehumidification, the individual control allows for greater personal comfort, and the lack of ductwork added to the anti bacterial filters and construction of the Samsung units prevents the spread of airborne contaminants.

Control, the room where the Mini-split is installed requires separate temperature control from the rest of the building, or was added after the rest of the building structure was completed. The continuous fan operation provides very accurate temperature sensing of the room as the unit is always sampling the return air temperature and then it will control the unit based on this temperature

Easy Installation, Mini-splits are generally small in physical size, they are very easy to install (typically less than 4 hours/unit), and the variety of styles mean that they can be installed in almost any suitably sized area.

Noise Levels, because the indoor unit shares the living space with you, they are designed for the lowest noise levels possible, approximately 30 Db. The outdoor units are also much quieter than conventional central air conditioning condensing units. This means that they can be installed in areas close to property lines without disturbing your neighbor's.

Applications

Computer or Data Server Rooms

Mini-splits are designed to cool people and keep them comfortable. That means the typical range of temperatures for the zone is 70-72 DegF. Mini Splits were not specifically designed for cooling server rooms or other data rooms however this is a very common application, and also the #1 Technical Service issue.

Sizing

Sizing of the Mini Split to the room is **EXTREMELY IMPORTANT.**

Samsung recommends a 12,000 Btu/h capacity per 200 to 250 Sq Ft of room size. Do not exceed this sizing guideline

Larger units in smaller areas than the guideline states cause the supply airflow from the unit to “bounce back” into the return air stream of the unit

The room temperature sensor is located on the unit in the return air stream, if the supply air “bounces back” into the unit, it will satisfy the sensor and the unit will shut down. Then due to the heat load in the room the sensor will quickly sense a rise in temperature and call for cooling

This leads to short cycling of the unit and a much reduced unit life span.

Do not install Samsung Mini Splits in rooms less than 100 Sq Ft

Unit Location

Ensure that no obstacles to air flow exist within 10 feet of the unit, be especially aware that Computer server units create an airflow baffle and can affect airflow to and from the unit.

The Samsung unit must be installed high on a wall so that the airflow is unimpeded

Cont

Sensible Heat and Humidity

Samsung units are designed for an approximate SHR of 0.66.
Be aware that low humidity conditions will further reduce unit performance, requiring either additional higher fan speeds to be programmed into the unit, or introduction of some latent load into the room

Compressor Run Times

To ensure compressor longevity it is paramount that the compressor run time be longer than 5 minutes at all times throughout the year. This will allow oil return to the compressor, and will ensure that the maximum number of starts per hour is not exceeded.

If the compressor run time is less than 5 minutes, this is very indicative that the unit is oversized.

Ambient

The other major issue with Computer or Data rooms is that they are designed to operate 365 days 24/7. This means that the Outdoor unit will be exposed to temperatures below the minimum design ambient of 60 DegF (AS model series)

Therefore for operation for these ambient temperatures, Samsung insists on the following three items being installed on the system

1. ICM 326H Fan Speed controller.

2. Crankcase Heater on all AS07, AS09, AS24 & AS30 units, and on ALL units manufactured prior to 2004

3. A Wind Baffle on the coil inlet and the exhaust of the condenser fan. This will isolate the unit from any wind that could cause the unit to over condense and slug liquid back to the compressor.

Multi Splits

Do not use Multi Splits in a Computer, Server or Telecommunications room.
Always use a Single zone unit, preferably a cooling only unit for these types of room, no matter how tempting it is to use a Multi Split

Applications

Commercial, Offices, Shops, Churches etc

Sizing

Sizing of the Mini Split to the room is EXTREMELY IMPORTANT.

Samsung recommends a 12,000 Btu/h capacity for each 350 to 400 Sq Ft of the Room

Do not exceed this sizing guideline for the same reason as the computer room application information

Do not install Samsung Mini Splits in rooms less than 100 Sq Ft

Ambient

Check as to the lowest ambient temperature that will be required for cooling, the minimum design temperature for the Outdoor unit is 60 DegF, (AS/AQ model series) If cooling is required below that, down to 32 DegF, Samsung insists on an ICM 326H Fan Speed controller being installed on the Outdoor unit. On AS07 & AS09 units, and AS12/18 prior to 2004 a Crankcase Heater should also be installed.

Filters

Samsung Mini Splits, because of the constant operation of the fan require much more frequent filter cleanings or replacements than the standard “ducted US style” units which are generally used for commercial buildings. Samsung recommends that the filters are cleaned every 8 weeks of operation, more frequently in areas subject to dirtier conditions e.g. Warehouse offices etc

Condensers located inside the Building

Especially with Warehouse or additional office space the condensers can be installed inside the building, this provides two specific issues to address

1. Lower ambient, these units are rated at 95 DegF ambient, if the ambient in the building does not rise above 80 DegF, we can downsize the unit as it will produce more capacity and operate more efficiently
2. Cleaning the condenser coil, use soapy water and keep the condenser coil clean, put it on the same schedule as the indoor unit filter cleaning

Applications

Residential

Sizing

Sizing of the Mini Split to the room is EXTREMELY IMPORTANT.

Samsung recommends a 12,000 Btu/h capacity for each 550 to 600 Sq Ft of the Room

The throw of a 7, 9 or 12,000 Btu/h unit is approximately 18 feet, and the 18, 24 and 30,000 Btu/h units have a throw of approximately 25 feet.

Therefore when applying these units in a residential application make sure that the units are not mounted at the top of the stairs blowing directly onto a wall or inside a niche or cutout in a room.

Again the temperature sensor is designed to sense the returning air after it has been supplied to the room, extracted the heat and humidity and then returned to the unit, not when it has been bounced directly back off a wall or other obstacle

Ambient

As standard the units are capable of cooling down to an ambient of 60 DegF, (AS/AQ Series) which is sufficient for the majority of residential applications

Indoor unit Location

For optimum unit operation the Indoor unit has to be mounted a minimum of 6 feet from the floor. A minimum height of 4 feet must be maintained for correct unit operation

Outdoor unit location

The Outdoor units are designed to operate with extremely low noise levels compared to the standard US condensing unit, this allows the outdoor units to located in areas closer to property lines, however when locating the Samsung Outdoor unit ensure that the spacing detailed in the Installation manual are observed.

Applications

Low Ambient

As stated in the specific applications :
The following models are capable of providing Cooling operation down to an ambient temperature of 60 DegF. Therefore to operate in Cooling down to an ambient temperature of 32 DegF they require the installation of an ICM326H Fan Speed Controller

AS – Cooling only

AS07A6MA
AS09A6MAF
AS12ABMCF
AS18A0RCF
AS24A2RC
AS30C2BC

AQ – Heat Pump

AQ09A6MAF
AQ12ABMCF
AQ18A0RCF
AQ24A2RC
AQ30C2BC

AM – Cooling only Multi Splits

AM18B1C2 (plus extra probe)
AM26B1C2 (plus extra probe)
AM27B1C3 (plus extra probe)

AP – Floor Standing

APC3240C
AP500PF

The following units have Low Ambient operation, down to 32 DegF installed as standard, and do not require any additional low ambient kit to be installed

ACC – Cooling only Cassette

ACC1800C
ACC2400C
ACC2800C
ACC4400C

ACH – Heat Pump Cassette

ACH2400C
ACH2800C

The following units SHOULD NOT BE USED in an application which requires cooling below a 60 DegF ambient

AD18B1C2
AD26B1C2

Applications

Heat Pump

The Samsung Heat Pump units are NOT fitted with any type of auxiliary heating for back up heat during periods of time when the outdoor ambient is to cold to allow for full capacity operation

Due to this the following is true

The Colder the air outside the lower the capacity and supply air temperature provided by your Samsung Heat Pump unit

This means that as the temperature falls below 32 DegF the unit produces less heat and the air coming off the unit starts to feel cold to the touch

Below 14 DegF the heat output is greatly reduced, the energy input greatly increased and we recommend that the unit not be operated fro more than 3 hours continuously. The supply air temperature will be below body temperature

Therefore we recommend that the Samsung heat pump should NOT be used as the primary source of heating for areas where the Outdoor temperature can fall to 14 DegF or below.

If a Heat Pump is used please ensure that an additional source of heat (baseboard electric or hydronic, or other type) be used when the temperature falls below 24 DegF

Defrost

However the Samsung unit does have “Demand Defrost” which allows the unit to choose when to enter into defrost based upon various operating characteristics, not just every 30, 60 or 90 minutes as most heat pumps

The defrost is based upon the following requirements, if these criteria are satisfied

Defrost Starts IF	1	Indoor Coil Temperature drops 1 DegF for Consecutive 6 minute periods
	2	Indoor Coil Temperature is below 104 DegF
	3	Compressor has been running for a minimum of 20 minutes total

Cont

OR

Defrost ALSO Starts IF	1	Total Compressor run time is over 3 hours
	2	Indoor Coil Temperature is below 104 DegF
	3	Compressor has been running for 6 minutes continuously

During Defrost the Indoor fan motor will stop so that cold air is not blown into the room.

The Indoor fan motor will only start again when the unit has returned to heat pump heating and the indoor coil temperature reaches 131 DegF, this is Samsung's warm start,

When the unit is first started in Heat Pump mode the Indoor fan motor will also not run until the coil temperature has reached 131 DegF

Heat Pump Heating on the Remote Control

The symbol on the Remote Control for Heat Pump Heating can be a little confusing

The symbol that is a SUN is the correct symbol for Heat Pump Heating
Press the mode button until the SUN is displayed, and then select the desired temperature and fan speed and the unit will operate in Heat Pump mode

The symbol that looks like a FLAME is actually a DRIP of water. This mode is the DRY mode, which is used to cool the room down at the lowest possible fan speed, which removes the most moisture from the room.

Therefore if your customer complains that his heat pump is not operating in heating, first check that he has it in the correct mode on the remote control

Reversing Valve

The reversing or 4 way valve is energized for HEATING in a Samsung unit. If the unit does not produce heat when in the Heat Pump mode, check for line voltage at the solenoid coil on the valve. If a replacement valve or coil is required, note the valve manufacturer to ensure that the correct assembly is provided.

Applications

Multi Splits

Multi Splits are units with a single Outdoor unit, (with multiple compressors) and dual or triple Indoor units. Each Indoor unit has its own line set and hand held remote controller.

Multi Splits are designed to be able to cool separate zones with the convenience of a single outdoor unit. We do not recommend that the units be used to cool the same zone, unless they can be spaced a minimum of 25 feet apart on the wall or ceiling

Do not ever place two Multi Splits where they blow directly into each other

Model Configuration

AM18B1C2	2 x 9,000 Btu/h Cooling only systems
AM26B1C2	2 x 13,000 Btu/h Cooling only systems
AM27B1C3	1 x 13,000 Btu/h Cooling only system 2 x 7,000 Btu/h Cooling only systems
AD18B1C2	2 x 9,000 Btu/h Heat Pump systems
AD26B1C2	2 x 13,000 Btu/h Heat Pump systems

Line Runs

AM18B1C2	50ft total with 23ft lift – Each Indoor unit
AM26B1C2	50ft total with 23ft lift – Each Indoor unit
AM27B1C3	13,000 Btu/h unit 50ft total with 23ft lift 50ft total 23ft lift – Each 7,000 Btu/h unit
AD18B1C2	50ft total with 23ft lift – Each Indoor unit
AD26B1C2	50ft total with 23ft lift – Each Indoor unit

Cont

Control Wiring

Each Indoor unit has its own set of control wiring

It is very important that you :

WIRE THE “A” UNIT CONTROL TERMINALS ON THE OUTDOOR UNIT TO THE “A” INDOOR UNIT, “B” UNIT CONTROL TERMINALS TO THE “B” INDOOR UNIT ETC

This seems very easy, but we answer multiple technical phone calls where this has not been done and the units operate backwards and freeze up the Indoor units or do not cool

Samsung recommends that the installer runs the refrigerant piping and electrical wiring together and connects one circuit at a time to prevent this mistake

Communication

The AM27B1C3 and the AD18/26B1C2 units use communication to control the Outdoor unit

With the AD units it is very important that these units are ADDRESSED, so that the Outdoor unit can correctly identify the Indoor unit that requires compressor operation

Address Settings

A Unit		B Unit	
SW01	SW02	SW01	SW02
L	H	H	H

DO NOT USE L & L

Failure to address the units will result in a CO code being displayed on the Outdoor unit PCB, individual Indoor unit communication errors will be shown as a CA and CB respectively

Applications

Ceiling Cassette Units

Ceiling Cassette units are designed to be mounted in a drop ceiling. They do not fit exactly into a 2' x 4' ceiling tile. 4 tiles should be removed and the cross bars cut away, the unit chassis will then fit inside the space created. The tiles will then be trimmed to suit and will lay on the fascia panel which is attached to the Indoor unit

Ceiling Cassettes are designed for use in mostly commercial applications, so make sure that the Commercial sizing guides are adhered to.

Fresh Air

The Samsung Ceiling Cassettes are not capable of introducing fresh air from outside the room

Ducted Discharge

A single ducted discharge can be attached to the Indoor unit chassis to allow up to 15% of the unit airflow to be provided to a remote location e.g. Bathroom, small office etc. For optimum operation, the duct size should be a minimum of 8" diameter and the DB97-00265A Air Block Off kit should be installed in the Indoor unit supply air discharge. Maximum of 2 can be used per Indoor unit

Control Wiring

The ACC/ACH units communicate between the Indoor unit and the Outdoor unit. Communication wiring is a dual wire (ACC1800C) and single wire (All other units)

This communication wire should be separated by at least 2" from the high voltage power wires and not routed next to or over any other high voltage device e.g. florescent lights

Controls

As standard these units are supplied with a Wired Remote control
If Wireless or Infra Red Hand Held control is required this option kit must be ordered separately.

The kit consists of 2 pieces	Hand Held Remote
	I/R Signal receiver for the Fascia Panel

Applications

Floor Standing Units

Floor standing units are designed primarily for the hospitality industry, bars, restaurants, hotels etc. They can be placed in a corner or recessed into a wall and provide cooling for a large area in a quiet, convenient unit

The units are very easy to install and maintain as all access is via the removable front panels on the indoor unit

Power Supply

The AP500PF is unique in the Samsung model line up, as this unit is the only 3 PHASE model available.

The Outdoor unit operates on 208/230V – 3Ph – 60Hz, and the Indoor unit is fed 208-230V – 1Ph – 60Hz from the Outdoor unit

Auto Restart

Until the mid 2002 model year, these units did not feature Auto restart after a power failure. If the unit has a serial number P1_ T6_____ and later, it should have auto restart as standard. To retrofit an earlier unit, a replacement PCB and temperature sensor (AP3240C) will be required

Longer Line Set Runs

Both of the AP units are available with a maximum line set length of 82ft total run, which includes an elevation difference of 49ft (trap at 25ft). This allows maximum flexibility in locating the Outdoor unit, when compared to a high wall unit of similar capacity

Accessories

To make the installation process simpler Samsung is pleased to offer the following accessories for our range of Mini Splits

Condensate pumps:

We recommend Sauerman pumps for our units. Remember all pumping systems require diligent maintenance and make noise during operation.
These small pumps may use the power supply provided at the indoor unit, provided the electrical requirements are adequate.
Float switches and alarms are sometimes used for obvious reasons.
The switch to deactivate the a/c unit may disrupt power to the Samsung indoor unit.
However, once the float returns to the normal setting, the wall mount unit with auto restart capability, will restart.
The switching mechanism of the float switch must be able to handle the current draw of the system.

We recommend wiring the alarm switch in series with the room temperature sensor as this will create an error code which will stop the unit and flash the operating lights to signify the fault.

Line Sets

Samsung offer Line Sets for all of the High Wall and Multi Split units in both a 25ft and a 50ft length

The advantages of these Line Sets are :

1. Both the Suction and “Expanded Gas” line are insulated with high efficiency 3/8” insulation. On all High Wall and Multi Split Samsung units both lines are required to be insulated as the Expansion Device for the system is located in the Outdoor unit

2. Electrical wire is included : As the Electrical Interconnect between the Indoor and Outdoor units is line voltage, 14 AWG wire is required. The Line Sets are supplied complete with 7 conductor 14 AWG wire, sufficient to be able to connect all Samsung models

3. Factory made flare connections, these allow for complete confidence in the connection at the Indoor and Outdoor units

Cont

Samsung Electrical Cables

14 Gauge wire is required in North America for all the interconnect wiring

7 interconnecting wires are the most required between indoor and outdoor units – AQ24 and AQ30 systems

Disregard the information in the Installation Manuals requiring the use of 18 gauge cables.

Low Ambient Controller

Refer to Page 7 for Low Ambient information

Condenser covers

Samsung commercial systems come with a plastic cover. A cover is a good as long as the interior of the outdoor unit stays free of moisture. This moisture does more damage than leaving the Outdoor unit uncovered.

Mounting Brackets

Samsung offers wall-mounting brackets as an accessory.
Mounting the condensing unit on the wall is common throughout the world. Due to space and line run limitations. The condensing unit is very quite and light. The unit requires a 4” clearance from the wall.

These are manufactured by MURPRO and come complete with isolators and are completely adjustable.

Pre Installation Requirements

1. **Unit sized correctly and applied correctly**

Refer to Pages 4, 5, 6 & 7 for information on the sizing and requirements for the specific application required. If in doubt call Technical Service for advice

2. **Electrical Requirements**

All the Samsung units require Line Voltage interconnect for both power for the Indoor unit and Control voltage for the Outdoor unit.

There is NO 24V AC wiring on these units, therefore all the electrical wiring between the units MUST be in 14 AWG

The Outdoor unit should be fed with power from the Breaker or Disconnect box. The Outdoor unit will provide power for the Indoor unit.

Do not install local disconnects or J boxes adjacent to the Indoor unit as this can cause mis-wiring and polarity issues for the system

3. **Breaker Size**

Check the Breaker Size is correct for the system, Samsung units do not have start components for the compressor, and therefore they rely on the correct power and amperage supply to start

Unit	Power Supply	Breaker Size
AS07	115V-1Ph-60Hz	15A
AS/AQ09	115V-1Ph-60Hz	15A
AS/AQ12	208/230V-1Ph-60Hz	15A
AS/AQ18	208/230V-1Ph-60Hz	20A
AS/AQ24	208/230V-1Ph-60Hz	25A
AS/AQ30	208/230V-1Ph-60Hz	30A
AM18/26	208/230V-1Ph-60Hz	20A
AM27	208/230V-1Ph-60Hz	20A
AD18/26	208/230V-1Ph-60Hz	20A

Cont

4. Line Set Lengths and Sizes

Ensure that the Maximum Line Set lengths are observed, the System will not operate correctly and will probably experience premature failure of its components

Do not upsize or alter the Line Set Sizes from those published, Samsung cannot guarantee operation with incorrectly sized Line Sets

Model	Suction	Expanded Gas	Total Length	Lift
AS07	3/8”	¼”	50ft	23ft
AS/AQ09	3/8”	¼”	50ft	23ft
AS/AQ12	½”	¼”	50ft	23ft
AS/AQ18	½”	¼”	50ft	23ft
AS/AQ24	5/8”	¼”	64ft	26ft
AS/AQ30	5/8”	¼”	64ft	26ft
AM18	3/8”	¼”	50ft Each	23ft
AM26	½”	¼”	50ft Each	23ft
AM27 (13k unit)	½”	¼”	50ft each	23ft
AM27 (7k units)	3/8”	¼”	50ft each	23ft
AD18	3/8”	¼”	50ft Each	23ft
AD26	½”	¼”	50ft Each	23ft

Model	Suction	Liquid	Total Length	Lift
ACC18	5/8”	¼”	98ft	49ft
ACC24	5/8”	¼”	98ft	49ft
ACC28	5/8”	¼”	98ft	49ft
ACC44	¾”	3/8”	164ft	82ft
ACH24	5/8”	3/8”	98ft	49ft
ACH28	5/8”	3/8”	98ft	49ft
AP32	5/8”	3/8”	82ft	49ft
AP50	¾”	3/8”	82ft	49ft

Cont

5. Indoor Unit Positioning

High Wall units must be mounted high on the wall, use a height of 6 to 8 feet, with nothing that would restrict airflow in front of the indoor units. This will provide optimum operation

The air returned to the indoor unit must be indicative of the true temperature of the entire space. When the unit is high on the wall, and the discharge air travels along the longest path possible to return to the unit (no blockage or reflected air returned) the system will operate properly. Wall units throw air approximately 18' (7, 9 & 12,000 Btu/h units) and 25' (18, 24 & 30,000 Btu/h units)

6. Outdoor Unit Positioning

Ensure that a minimum distance of 4" behind the unit, and 24" in front of unit is maintained; otherwise the condenser airflow will be affected.

Ensure adequate access for service and repair is provided. The easiest access to the unit can be obtained by removing the top cover to the condensing unit

All valve and electrical connections are on the RHS of the Outdoor unit when looking at the condenser fan

Installation Tips

1. **Samsung units do not use a filter dryer on the original Installation**

Avoid problems with a clean installation of refrigerant lines. The system must be put into a deep vacuum (400 Microns minimum) and pressure tested with nitrogen.

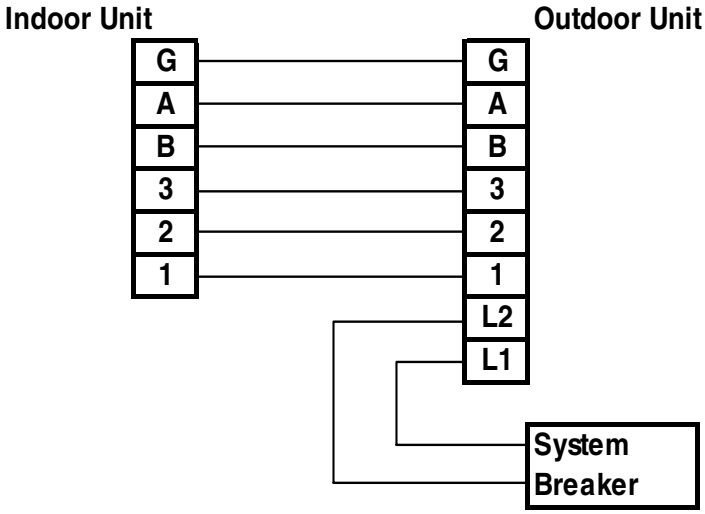
On Heat Pump systems it is good practice to insulate the flare nuts to prevent loosening as the system operates.

2. **Electrical Wiring Connections**

Samsung systems are ALL POLARITY SENSITIVE to the power supply, even the 208/230V units, it is very important that the wiring from Outdoor to Indoor unit is point to point, with the wire leaving one terminal on the Outdoor units and landing in the same numbered or lettered terminal on the Indoor unit

This is a sample electrical interconnect for the following units

AS18A0RCF/AS24A2RC/AS30C2BC



208/230V Power is supplied from the Breaker on L1 & L2
208/230V Power for the Indoor unit is provided on A & B
Compressor signal is Terminal #1
Condenser Fan Low Speed is Terminal #2
Condenser Fan High Speed is Terminal #3
G is Ground (or Earth as it is sometimes called)

Cont

3. Number of Electrical Interconnect Wires

If a question on the wiring occurs, the best manual to consult is the Service guide as it contains the unit wiring diagrams

Model	Number of Interconnect Wires, including Ground
AS07/09/12	4
AQ09/12	6
AS18/24/30	6
AQ18/24/30	7
AM18/26/27	4 per Indoor Unit
AD18/26	4 per Indoor Unit
ACC18	5
ACC24/28/44	4
ACH24/28	4
AP32/500	4

4. Opening the Service Valves

After pressure testing and evacuation, the charge for the system has to be released from the Outdoor unit.

To do this, it is very important that the
SUCTION SERVICE VALVE MUST BE OPENED FIRST

This will allow the refrigerant to flood the system without passing through the capillary tube. If the Liquid service valve is opened first it is possible to log Oil in the capillary tube, especially if the Outdoor temperature is low

If this happens the unit will drop into a vacuum immediately on start up of the unit, to repair this either recover the refrigerant charge and start evacuation again or it is possible to clear the log by driving up the condenser head pressure by blocking off the outdoor coil or unplugging the condenser fan

Cont

5. Adding Refrigerant Charge

If the unit interconnect length exceeds the standard charge length of the system, additional refrigerant must be added to the system. Samsung systems do not have a set length for this standard charge, on some units it is 16ft, some units it is 25ft. Always check the Service or Installation manual for your unit

The additional refrigerant MUST BE WEIGHED INTO THE SYSTEM, as these are critically charged systems

The additional amount of refrigerant required is calculated from the extra length of interconnect multiplied by the refrigerant quantity in oz/ft. All systems used R22

AS07 & AS/AQ09	Add 0.2 oz/ft
AS/AQ12&18	Add 0.3 oz/ft
AS/AQ24/30	Add 0.4 oz/ft

Model	Standard Charge Length (ft)	Additional charge for various lengths (oz R22)			
		25ft	35ft	50ft	64ft
AS07	16	1.8	3.8	6.8	N/A
AS/AQ09A6MA	16	1.8	3.8	6.8	N/A
AS/AQ09A6MA**F**	25	0	2.0	5.0	N/A
AS/AQ12	25	0	3.0	7.5	N/A
AS/AQ18	25	0	3.0	7.5	N/A
AS/AQ24	16	3.4	7.4	13.4	19.2
AS/AQ30	25	0	4.0	10.0	15.6
AM18/26	50	0	0	0	N/A
AM27	50	0	0	0	N/A
AD18/26	33	0	0.4	3.4	N/A

6. Condensate Piping

Follow installation instruction and remember water runs down hill.
Installation diagram is in the Installation and Operation Manual

Common Technical Problems

These are a sample of the common Technical questions that are asked of our Technical Support staff. By having these available it may help diagnose a problem before calling

1. **No operation Indoor Unit – No Indicator lights on the unit**

If the Indoor unit has power to it, but it will not operate, first check the 3.15A Fuse that is mounted on the Indoor PCB (Microprocessor). This fuse is used to protect the PCB from spikes or changes in the power supply, therefore it is common to require this fuse after electrical storms or power outages

Replacement fuses can most easily be obtained from Radio Shack or Car parts stores. The fuse is a glass Buss type

2. **No Compressor or Condenser Fan Operation on start up**

This is due to the polarity on the power supply being reversed, which allows the control relays to close on the same leg, giving 0V at the compressor.

The reason that Samsung units have polarity even on 208/230V power is that they are built for the world marketplace. The rest of the world uses a 220V “Hot Leg” and a 0V Neutral leg. This means that the unit switches the “Hot Leg” via the PCB and sends it back to the Outdoor unit to start the compressor and condenser fan

This can be alleviated by wiring the unit in multi colored wires (see the Samsung wire in the accessories section), or by making sure that the wiring is exactly point to point per the diagram – See the interconnect diagram on Page 18 of this manual)

Cont

3. PCB – All Indicator Lights Flashing

This is due to the Indoor PCB having lost its communication with the Remote Control and becoming “confused” as to what it outputs should be

This is very easy to correct, it requires the Indoor unit to be powered up, the Remote Control in hand and the correct code for the unit. The code can be found either in Service guide or from calling Technical Support

The batteries from the remote control are removed, and WHILE holding down both of the temperature Up/Down keys replace the batteries in the remote

This will cause the display to change to 6 zeros

Then by using the : Temperature UP button the 2nd Zero can be changed
Temperature DOWN button the 3rd Zero can be changed
Fan Speed button the 4th Zero can be changed
ON Timer button the 5th Zero can be changed
OFF Timer button the 6th Zero can be changed

Then the MODE button is pressed
This will cause the display to change to 1 and 5 zeros

Then by using the : Temperature UP button the 2nd Zero can be changed
Temperature DOWN button the 3rd Zero can be changed
Fan Speed button the 4th Zero can be changed
ON Timer button the 5th Zero can be changed
OFF Timer button the 6th Zero can be changed

After this the remote is aimed at the Indoor unit and the ON/OFF button is pressed, this sends the signal to the Indoor unit, reprograms it, and just the STD light will flash.

Remove the batteries and replace normally

Select the required mode and temperature, and transmit to the unit, it will now operate normally

This procedure will also be required should the Indoor PCB be replaced as this allows the correct code for the model to be programmed

Cont

4. **My Cassette Wired Remote Controller reads in Degree Celsius**

Again because these units are designed for a world market they have the ability to display the set and actual temperature in Celsius and Fahrenheit. The default setting is Celsius

To change the display use the following :

Turn Off the power to the system at the Breaker
Open up the Wired Remote Controller, on the PCB in the controller there are 4 Dip Switches
Locate Dip Switch #3 and switch it to the OFF position (opposite) position
Re-assemble the Wired Remote and turn the power back on
The display will now read in Fahrenheit!!

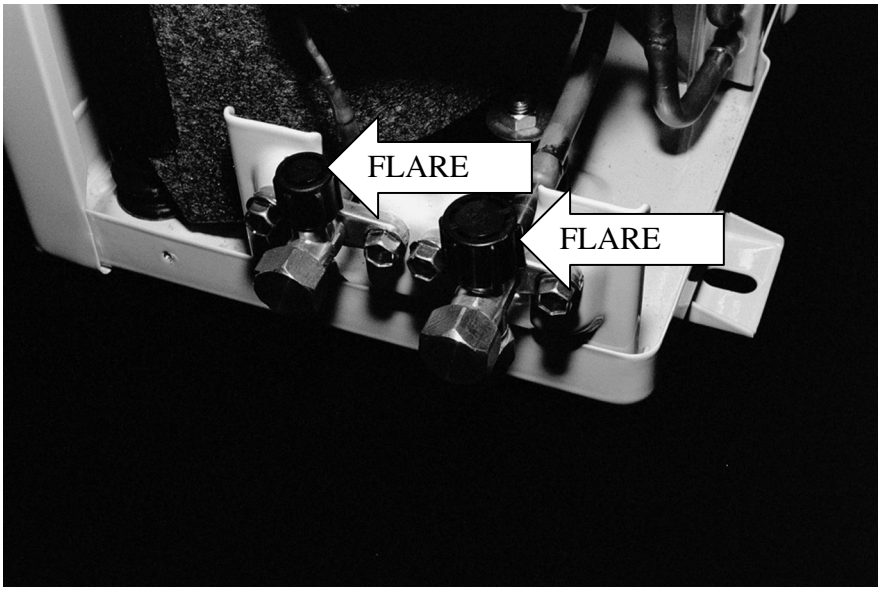
5. **I can't get the Flare nuts to fit on the Service Valves**

This is a more common call than we expected it to be. The Service Valves have two separate threaded connections

The threaded connection for the Flare nuts (supplied with the unit)
These are found UNDER THE BLACK PLASTIC CAPS

The close machined thread for the Service Valve Stems
These are found UNDER THE BRASS CAPS

DO NOT TRY TO PUT THE FLARE NUTS ON THE THREADS FOR THE SERVICE VALVE STEMS – THEY WILL NOT FIT



Maintenance

Mini Splits are very easy to maintain, in reality they are not very different to the maintenance on a Central A/C or Heat Pump system, and can be placed on a similar maintenance schedule with one major exception.

Filters & the Continuous Fan

All Mini Splits feature continuous Indoor fan operation when the unit is powered and turned on, the Indoor fan does not cycle with the compressor as is common with the standard “US style” systems

The reason for this is :
While the system is on, the fan slowly moves air throughout the conditioned space, monitoring the temperature of the air returning to the fan coil. This action provides accurate temperature control and eliminates temperature and air stratification inside the room.

The system will quickly react to changes in temperature in the conditioned space, allowing a minimal temperature fluctuation and a more comfortable environment.

The energy use and wear on a constantly moving fan is less than a fan constantly starting and stopping. The additional cost per year is negligible;

It can be compared to a 40-watt light bulb being used all year (approximate cost per day of less than a quarter) to a 1/3 to ½ (500 to 750 watts) hp motor. (Which is started and stopped 4 to 6 times in an hour, consuming far more energy and costing more : 500W x 20minutes = 166W consumed per hour versus 40W for the Samsung unit

But the constant fan operation does have one drawback, the unit air filters work harder and therefore clog up faster than on a regular central unit

Therefore Samsung recommends that in a residential application the 2 large Air Filters be cleaned MONTHLY & the two smaller optional filters be replaced every 2 MONTHS

This is very important, especially with the lower airflows of the Samsung units any loss of airflow due to dirty or clogged filters can cause the unit to possibly freeze up the indoor coil or to cycle on the freeze protection thermostat

Window Units

For 2004 all of the Window units available from Samsung will use Electronic controls and a hand held remote control

Models are available from 5,000 to 24,000 Btu/h, they are cooling only with NO electric heat or Heat Pump options available

Window unit warranty is the same as the Samsung Mini Split warranty, unless the 1-800-SAMSUNG number is used, when labor can be provided IF the unit is return to one of 6 Samsung repair centers in the US

Warranty parts for the units (no labor allowance) can be obtained from Quietside/Samsung using a standard warranty claim form.

Website

The Quietside/Samsung website has been heavily modified to further assist you in obtaining information on all of our products. The address is

www.Quietside.com

Once you visit the website, go directly to SPECS tab
Click on Trade Partner, clicking on the End user section allows limited access to specification sheets and user information
The initial User ID is guest (all lower case) and the password is quiet (all lower case)

Then you can enter in your details and obtain your specific USER ID. This will allow you to access all of the information on the site

New additions to the website include
AQ09 – Operational animation using the remote control to control the unit
Line set and charge calculator – This will allow you to calculate the additional charge required or check if the line set design falls within our parameters
Parts finder – This is currently being constructed but the parts sections that are in place allow you to roll the mouse cursor over the number for a part and see the specifications and even a photo of that part. Also available are wiring diagrams

All these functions can be found underneath the TOOLS tab on the main home page

Warranties and You

IN 2003 THE SAMSUNG WARRANTY PERIOD CHANGED

THE CURRENT SAMSUNG WARRANTY IS 5 YEARS COMPRESSOR, ONE YEAR PARTS FOR UNITS MANUFACTURED FROM 2003 ONWARD. THIS IS SIGNIFIED BY A W IN THE 4 DIGIT OF THE SERIAL NUMBER

Samsung warranty reflects a confidence in our product. Millions of Samsung air conditioning products have been sold throughout the world and in North America

When a problem is discovered, it is generally from an outside factor. Shipping, Concealed Damage, Improper installation and/or application, bad voltage, miss wiring and generally not reading the instructions. These are not valid warranty issues.

Samsung distributors are responsible to pre-qualify the contractor by evaluating their experience. Provide customer service and warranty processing.
Many make mistakes because they do not know what to do, or what the Samsung warranty procedures are.

Following proper procedures will expedite warranties.

A warranty claim form must be filled out completely and reviewed by the distributor. After review by the distributor, the claim is sent to Samsung via fax 1-562-463-5665. If it is not filled out correctly it will be returned to the distributor be to corrected

Samsung will respond to the distributor or contractor within one business day (24hours).

***IF* a claim is determined to be valid Samsung may contact the contractor or technician to review the installation. When approved, warranty parts will be expedited.**

Remember: **"No Claim Form, or an incorrectly filled out form = No Action"**

Extended Warranties

Extended warranties, backed by Equiguard are available through your local Samsung distributor

Manual Notes

THANK YOU FOR READING THIS MANUAL, WE HOPE IT HAS BEEN INFORMATIVE.

PLEASE NOTE THAT ALL SAMSUNG UNITS ARE SUBJECT TO CONTINOUS IMPROVEMENT AND SPECIFICATIONS CAN CHANGE WITHOUT NOTICE PLEASE CHECK THE INFORMATION SUPPLIED WITH THE UNIT BEFORE INSTALLATION

ALL SIZING GUIDES CONTAINED IN THIS MANUAL ARE SUGGESTIONS ONLY PLEASE PERFORM AN ACCURATE HEAT LOAD ANALYSIS PRIOR TO SELECTING AND INSTALLING YOUR SAMSUNG MINI SPLIT

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